

## ABSTRACT OF THE DISCLOSURE

[0048] An ion mobility spectrometer is disclosed wherein the ionization element is a corona discharge source (300) consisting of: a first chamber (308) provided with an inlet (309) for a gas to be analyzed and with at least one first opening (311) for communication between the internal space  
5 of the first chamber and the reaction zone of the spectrometer; a second chamber (303), contained in the first chamber, provided with an inlet (306) for an ultra-pure gas or a mixture of ultra-pure gases, and with at least one second communication opening (310, 310') between the first and the second chamber; a pair of electrodes (304, 302'), at least one of which (304) is needle-shaped, arranged in the second chamber, with the pair of electrodes and the second opening arranged in such  
10 geometrical relationships that there is no optical path between the zone of the corona discharge and the ion detector of the IMS instrument. The instrument of the invention allows to reproduce the results of a spectrometer equipped with a <sup>63</sup>Ni ionization source, while avoiding the problems connected to the transportation and use of radioactive material.